

NEWSLETTER

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Contacts

**Please contact us (see
final page):**

- If you have any suggestions for articles for future newsletters or would like to comment on this one
- If you would like to offer to help
- If you have any comments on any matter related to resource and

RESOURCE AND ENVIRONMENT GROUP — ENERGY

This issue focuses on energy: what it costs to get, how the world's resources are changing and what happens if we did use all those (fossil fuel) reserves.

Energy supply is a long term issue, subject to many uncertainties, and likely to be increasingly regulated. Could it become in time a significant area of actuarial practice?



RECENT EVENTS

REG Networking Evening 28 November 2012

Over 60 attended this event which also had an energy theme (energy modelling for the current Energy Bill, carbon capture and storage insurance, financing nuclear decommissioning and ERM applications). It was rated a most enjoyable and stimulating evening. The presentations can be seen at:

<http://www.actuaries.org.uk/members/pages/reg-engagement-opportunities-0>

Sessional Research Event 17 January 2013

“Resource constraints: sharing a finite world. Implications of Limits to Growth for the Actuarial Profession”

This sell out event was the official presentation of the research commissioned by the Profession at the instigation of REG, which was conducted by a team led by Dr Aled Jones from Anglia Ruskin University. There was an excellent panel of speakers including Professor Jorgan Randers (who co-authored the original “Limits to Growth” in 1972) and Simon Upton from the OECD. It was a lively evening for Staple Inn, partly due to challenge from the Chair, Jo Confino of the Guardian. Watch for yourself at: <http://tiny.cc/indsrw> (and claim CPD). The papers can be downloaded from: <http://tiny.cc/aohqrw>

The paper has subsequently generated a fair amount of media comment generally complimenting actuaries for tackling a major long term issue for the Profession and society at large.

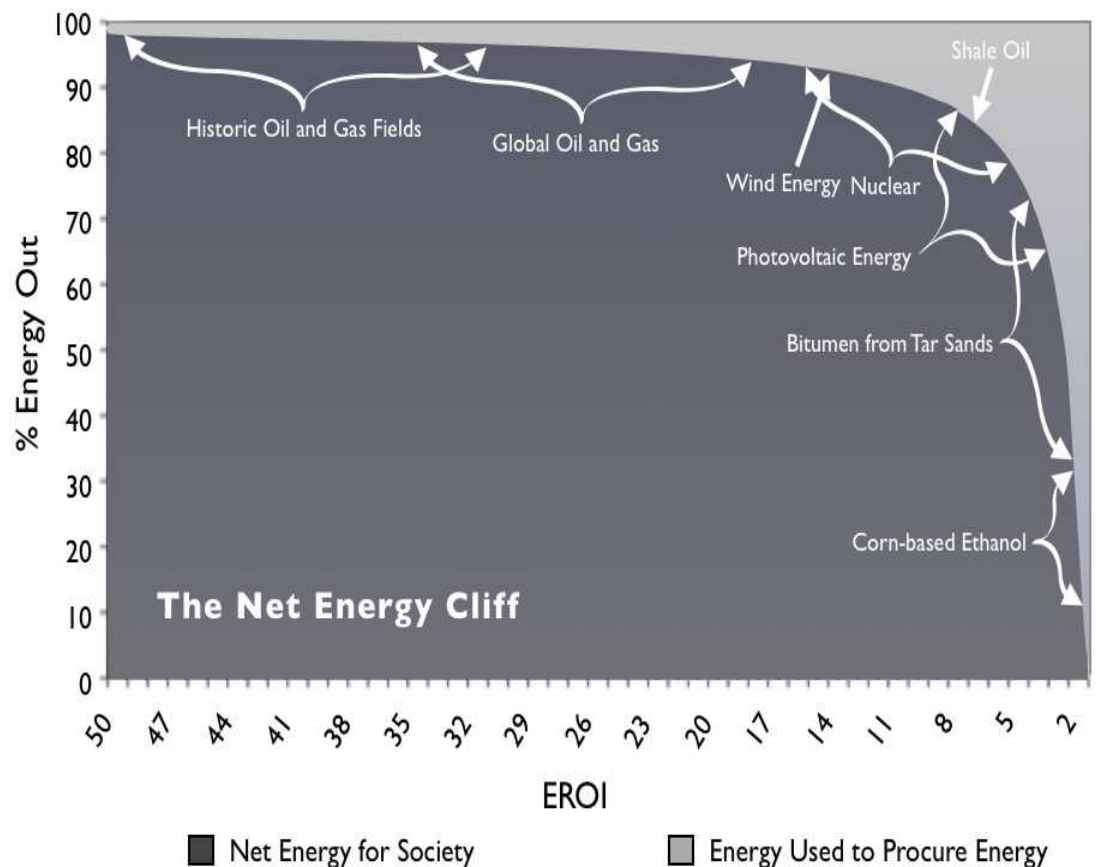
“The prosperity and stability of modern society is inextricably linked to the production and consumption of energy, especially oil “

Energy Return on Investment (EROI)

EROI is defined to be the ratio of energy returned from energy extraction and production compared to the energy invested in those energy gathering processes. Historically, energy sources like oil have provided a massive return on energy invested, but this is now reducing as more difficult sites are being tackled. This clearly increases energy costs and constrains economic growth. A recent preliminary report by the State University of New York, College of Environmental Science and Forestry, (sponsored by the UK Department for International Development - DFID) assesses EROI for various global energy resources. See: <http://tiny.cc/a4eqrw>

As a statistic, it will be appreciated that EROI involves extensive data, a number of assumptions and complex calculations, so a range of results is considered. Also, “EROI analysis does not assess the complex combination of physical, technical, environmental, economic, and social attributes that determine a fuel’s usefulness to society.” Such factors could possibly be worked into even more comprehensive EROIs.

The report states that if the trend towards higher cost extraction continues, and non-conventional sources do not provide sufficiently high EROIs, “we may be moving toward the ‘net energy cliff.’”:



The low EROI from corn-based ethanol, and the loss of land for food production which results from the increased use for biofuels, shows why these policies are being questioned. The report notes that, while wind and photovoltaic energy are argued to have substantial environmental benefits, factors such as the fossil fuels used in the creation, transport and construction of turbines and panels need to be adequately represented in the analysis. Additionally, the energy costs pertaining to intermittency of the resource need to be considered (the need for back up energy generation or storage mechanisms). The report does not appear to contain any significant analysis of shale gas and oil (from fracking) which has already made a huge impact on the US energy position.

World Bank: why a 4°C warmer world must be avoided

In November 2012, the World Bank published a report titled "Turn down the heat: why a 4°C warmer world must be avoided". The report outlines projected climate change impacts and, as indicated in the title, calls for urgent action based on a risk-based approach: *probability multiplied by impact*.

'Dangerous' climate change is conventionally considered to be above 2°C and the global community has more or less committed to try to hold warming below this level. But, even with full implementation of current mitigation commitments and pledges, consensus estimates from the scientific community are that there are (approximately) 10 and 20 % probabilities of exceeding a 4°C increase by 2070 and 2100 respectively. If these commitments and pledges aren't met, the likelihoods increase and the timelines shorten.

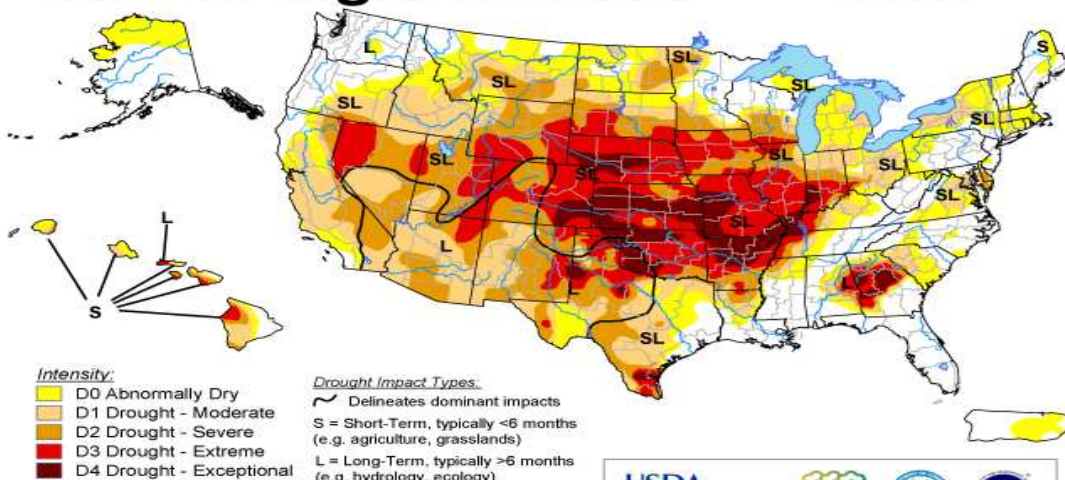
The report describes the significant potential impacts from unprecedented heat waves, severe droughts and major floods, and brings into focus the inherent inequity whereby the poorest regions are likely to experience the majority of negative impacts. The uncertainty around the magnitude of impacts (including potential runaway feedback loops) are highlighted too.

The very readable 65 page report was the result of a multidisciplinary and global collaboration, see: <http://tiny.cc/5afqrw>

"A 4°C world would be one of unprecedented heat waves, severe drought, and major floods in many regions"

U.S. Drought Monitor

August 28, 2012
Valid 7 a.m. EDT



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu/>



Released Thursday, August 30, 2012
Author: Brian Fuchs, National Drought Mitigation Center

not unprecedented, but likely to occur more frequently

*"No more than one-third
of proven reserves of fossil
fuels should be consumed
prior to 2050"*



IEA World Energy Outlook

The International Energy Agency also recently published their annual energy review:
<http://www.iea.org/publications/freepublications/publication/English.pdf>

This highlights the transformation of the US energy position resulting from fracking of gas and increasingly oil (whilst noting that environmental concerns could still "halt this revolution in its tracks"). The (re) emergence of Iraq to be one of the major oil producers is noted. However, amongst many interesting points it also states that no more than one-third of proven reserves of fossil fuels can be consumed prior to 2050 if the world is to achieve the 2 °C goal, unless carbon capture and storage (CCS) technology is developed and widely deployed. This provides strong support to the "unburnable carbon" campaign which we reported in last February's newsletter. Is this being reflected in the market prices of the oil majors?

We are listing below email addresses for the REG managing committee. You can also contact Craig Ajimuda (craig.ajimuda@actuaries.org.uk) who is communities leader for the Profession.

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The other means of communication within REG are listed here:
<http://tiny.cc/mrhqrw>

Visit the webpage (if you log in you will have access to a more complete list of REG documents):
<http://www.actuaries.org.uk/members/pages/resource-and-environment-member-interest-group-reg-mig>